

# Effect of quality of life improvement on type 2 diabetes patients' self-esteem

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## ABSTRACT

**الأهداف:** دراسة أثر تطوير جودة الحياة للمرضى المصابين بداء السكري في حياتهم اليومية وتقدير الذات.

**الطريقة:** أجريت دراسة عشوائية على 123 مريض مصاب بداء السكري من النوع الثاني راجعوا عيادة السكري في مستشفى الإمام الخميني، أردبيل، إيران. يتراوح أعمار المرضى من (30-70) عام تم تشخيصهم بداء السكري من النوع الثاني وتقسيمهم إلى مجموعة التجربة المكونة من 61 شخص ومجموعة التحكم المكونة من 62 شخص. اشتمل الاستبيان على الحالة الديموغرافية، ومقياس فارل وجرانت وروزنبرج لتقدير الذات كما تم تنظيم خطة جودة الحياة لتثقيف وتقييم المرض. وتعتبر القيمة الإحصائية أقل من 0.05 قيمة مهمة إحصائياً.

**النتائج:** أظهرت الدراسة بأن تقدير الذات للأفراد في مجموعة التجربة منخفض نسبة (13%) قبل التدريب لجودة الحياة المقدم لهم وبعد العلاج أصبح تقدير الذات لديهم متوسط (39%) ولكن الأفراد في مجموعة التحكم كان احترام الذات لديهم متوسط (62.5%) قبل الاختبار ومنخفض بعد الاختبار (12.9%) وكان هنالك علاقة مهمة إحصائياً قبل وبعد المعالجة ( $p < 0.05$ ).

**خاتمة:** أن تثقيف المرضى المصابين بداء السكري من النوع الثاني له أثر إيجابي على نمط الحياة المتبع وتقدير الذات ويساعد كذلك من الآثار الجانبية لتطور داء السكري من النوع الثاني.

**Objectives:** To study the effects of the quality of life (QoL) improvement on their QoL and self-esteem.

**Methods:** This was a random controlled clinical trial study on 123 type 2 diabetes patients admitted to the Diabetes Clinic in Imam Khomeini Hospital at Ardebil, Iran from April 2009 to June 2010. The 30-70 years old participants are afflicted with type 2 diabetes, and randomly divided into 2 groups (experimental group  $n=61$ , and control group  $n=62$ ). The questionnaires were composed of sociodemographic status, Farrel

& Grant, and Rosenberg's self-esteem questionnaires and the quality of life (QoL) improvement plan was codified to educate and evaluate them. A  $p < 0.05$  was considered significant.

**Results:** Our study showed that subjects in the experimental group had low self-esteem (13%) before QOL training, and they had moderate self-esteem after the intervention (39%), however, the control group had moderate self-esteem (62.5%) in the pre-test, and changed to low self-esteem (12.9%) in the post-test, and there was significant difference in the previous and next intervention ( $p < 0.05$ ).

**Conclusions:** The QoL improvement had positive effects on diabetic's self-esteem, and QOL as improved may help to reduce the side effects of type 2 diabetes process.

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Diabetes mellitus is a chronic disease characterized by metabolic abnormalities, such as elevated plasma glucose levels resulting from insufficient insulin, or resistance to insulin effects. Long-term complications affect the eyes, kidneys, nerves, and blood vessels that can lead to blindness, neuropathy, and kidney failure.<sup>1</sup> There are 4-4.5% of 30 year-old Iranians, and 14% of the older population have type 2 diabetes.<sup>2</sup> Quality of life (QOL) represents a broad, multi-dimensional concept that reflects an individual's sense of well-

being, or satisfaction with life circumstances.<sup>3</sup> Chronic medical conditions, such as type 2 diabetes can impact multiple aspects of QOL also.<sup>4</sup> During chronic diseases, patients are at risk of failing self-esteem that leads to less life satisfaction, increased prevalence of depression, and other physical diseases.<sup>5</sup> Self-esteem is a sense of one's own worth and has a prominent effect on one's mental health, as well as personality balance.<sup>6</sup> Research has shown that QoL and self-esteem are decreased in clients with chronic obstructive pulmonary disease and arthritis.<sup>5</sup> Success and failure affect self-esteem differently,<sup>7</sup> even daily events leading to changes in self-esteem.<sup>8</sup> People with low self-esteem usually focus on negative aspects of their life, and spend less time to think positively, so it is important to identify their strengths and weaknesses.<sup>9</sup> High self-esteem people are less stressed when they are faced with negative events.<sup>10</sup> In fact, positive attention to oneself is a stress barrier,<sup>11</sup> but low self-esteem is leading to impaired physical and mental health, substance abuse, and anti social behaviors.<sup>12</sup> Anxiety, weakness, hopelessness, inability, and fear are due to lack of self-esteem.<sup>13</sup> This aim of this study is to determine the effect of QoL improvement on self-esteem of patients with type 2 diabetes. We hypothesize that the patients in the experimental group who receive QoL education, improve their quality of life, and promote their level of self-esteem.

**Methods.** This was a randomly controlled clinical trial study, and the subjects age was between 30-70 years old with known type 2 diabetes. One hundred eighty individuals were selected randomly among patients admitted to the Diabetes Clinic of Imam Khomeini Hospital, Ardebil, Iran from April 2009 to June 2010. The participants were informed on the aim of study, and they filled-out a written consent form. Some subjects were excluded for dissatisfaction and uncompleted study form. The subjects were randomly classified into 2 groups. There are 14 sick subjects, and 22 unattended subjects in training sessions they were excluded. In all, there were 123 subjects - 61 subjects as the experimental group, and 62 subjects as the control group. The study process started in April 2009 to June 2010. The Rosenberg's Self-esteem and Farrell & Grant questionnaires were used to measure the participant's current self-esteem and QoL as a pre-test. The QoL improvement as an intervention factor was performed by face-to-face, group teaching methods, and handout to the experimental group. The QoL improvement program included a weekly group session of 45 minutes for 6 incessant weeks, limited to 8 patients per group. A nurse, a physiotherapist, a nutritionist, an orthopedist, and a psychologist directed the sessions. The education program was originally developed at

the diabetes outpatient that admitted to the Diabetes Clinic of Imam Khomeini Hospital affiliated to Ardebil University of Medical Science. The QoL improvement program contents of the sessions included information on the pathophysiology of diabetes, education in self blood glucose monitoring, the importance of physical activity, healthy diet, weight loss, medication, and smoking cessation if required, the late complications of type 2 diabetes, hypertension, and cardiovascular disease, and foot care (as a physical dimension of QOL), and social support included the resources provided by others to enable the person to feel valued and part of a reliable network of support - this could be family, friends, neighbors, government agencies, and organizations that are available to provide support if needed (as a social dimension of QOL), and the importance of control of stress and anxiety (as the emotional/spiritual dimension of QOL). The patients were then evaluated one month after the final intervention program by follow-up telephone contacts, and again participants filled the same questionnaires (Rosenberg's Self-esteem and Farrell & Grant questionnaires) as a post-test. After the post-test, the control group received handouts, and the same quality of life (QOL) educational program. The study was conducted according to the principles of the Helsinki Declaration. Azad University of Medical Science, Tehran Branch Committee of Biomedical Research Ethics, and the Iranian registry of clinical trials approved the study protocol. The inclusion criteria were: 30 years of age or older, have cognitive ability to answer the questions with the research instruments, agreed to take part in the study, and a known type 2 diabetes patient. The participants were excluded if they had: prior quality of life intervention during the last year, severe heart, liver, or kidney disease, or any incurable cancer, and chronic mental disorder background.<sup>14</sup>

**Instruments.** The questionnaire included 4 parts. 1. Sociodemographic questionnaire - this questionnaire was prepared to elicit information on demographic and clinical variables such as age, gender, marital status, level of education, family history of diabetes, and drugs.<sup>15</sup> 2. Rosenberg's Self-esteem questionnaire - to evaluate self-esteem, Rosenberg's Self-esteem instrument was used, adapted and validated for the Brazilian culture.<sup>16-19</sup> This instrument consists of 10 statements, which can either be agreed or disagreed with. The individual has 4 answer choices varying from "totally agree to totally disagree". In items 1, 3, 4, 7, and 10, the answer choice "totally agree" refers to the highest self-esteem, while this option points to the lowest self-esteem in items 2, 5, 6, 8, and 9. The internal consistency (Cronbach's alpha) of this instrument was reported ( $r=0.88$ ) for previous researches, but it was ( $r=0.73$ ) for the current study.<sup>2</sup> We also used test-retest for reliability. 3. Farrell and

Grant quality of life questionnaire - this instrument contains 36 QOL items using 10-point scales. These QOL items are divided into the 4 domains or subscales conceptualized by our QOL model. Following is the list of items identified by subscale: physical well being (items 1-11); psychological well being (items 12-24); social well being and spiritual well being (items 25-36). A statement asking the patient to share a story on living with a chronic disease as diabetes, and include the great challenges encountered in having diabetes follows these QOL items. Subscale scores are produced by adding the scores on each item with the subscale, and then divided by the number of items in that subscale. A total QOL score is obtained by adding the scores on all 10-point items and dividing by the total number of items.<sup>20,21</sup> The internal consistency (Cronbach's alpha) of this instrument was reported ( $r=0.80$ ) for previous researches, but it was ( $r=0.92$ ) for current study.<sup>19</sup> We also used test-retest for reliability.

**Statistical analysis.** The data were analyzed using Statistical Package for Social Sciences version 11 (SPSS Inc, Chicago, IL, USA). Descriptive analysis, Chi-square, and Fisher tests were used to determine the demographics correlation in experimental and control group. Wilcoxon and pair t test were used to compare before and after intervention scores of the experimental and control group. Furthermore, independent t test was used to compare both experimental and control group after intervention.  $P<0.05$  was considered statistically significant.

**Results.** The characteristics of 123 subjects (61 people of experimental group and 62 people of control group) are described in Table 1. The mean age of the experimental group was higher than that of the control group ( $p=0.016$ ). The other socio-demographic characteristics were the same for both groups and showed no significant difference ( $p>0.05$ ) (Table 1).

In the experimental group, QoL scores were supposed to be low (0-33.3%), moderate (33.4-66.6%), and high scores (over 66.6%). Before the QoL improvement they obtained 29.6% of the score that is low but after the intervention their score increased to moderate (33.8%),

and although the control group had moderate pre test QoL (29%), however it decreased to 14.9% for the post-test, and according to the Wilcoxon test, there was a significant difference in both pre- and post intervention scores ( $p<0.05$ ) (Table 2).

For the experimental group, self-esteem scores were deemed to be: low - 0-33.3%; medium - 33.4-66.6%; and high scores - over 66.6%, and before QoL improvement they got 13% of the score that is deemed to be low, however, after the intervention their score increased to moderate (39%), although the control group had moderate pre test self esteem (62.5%), but it decreased to 12.9% for the post-test, and according to the Wilcoxon test, there was a significant difference in both pre- and post intervention scores (high scores  $<0.05$ ) (Table 3).

**Table 1 -** Characteristics of respondents (n=123).

Characteristics	Experimental n (%)		Control n (%)	
<b>Age</b>				
30-40	13	(21.3)	20	(32.3)
41-50	15	(24.6)	26	(41.9)
51-60	17	(27.9)	8	(12.9)
61-70	16	(26.2)	8	(12.9)
<b>Sex</b>				
Male	31	(49.2)	30	(48.4)
Female	30	(50.8)	32	(51.6)
<b>Marital status</b>				
Single, divorced and others	4	(6.6)	12	(19.4)
Married	56	(91.8)	48	(77.4)
<b>Habitat</b>				
Urban	51	(83.6)	50	(80.6)
Rural	10	(16.4)	12	(19.4)
<b>Employment status</b>				
None	33	(54.1)	29	(46.8)
Have job	28	(45.9)	33	(53.2)
<b>Drugs</b>				
Tablet	43	(70.5)	42	(67.7)
Insulin	13	(21.3)	14	(22.6)
Tablet & insulin	5	(8.2)	6	(9.7)
<b>Family diabetes history</b>				
Yes	34	(55.7)	44	(71.0)
No	27	(44.3)	18	(29.0)
<b>Hospitalize history</b>				
None	30	(49.2)	33	(53.2)
One time	16	(26.2)	12	(19.4)
More than one admission	15	(24.6)	17	(27.4)
<b>Total</b>	<b>61</b>	<b>(100)</b>	<b>62</b>	<b>(100)</b>

**Table 2 -** Level of quality of life in experimental and control group.

Quality of life	Case				Control			
	Low	Moderate	High	Total	Low	Moderate	High	Total
Low	7 (3)	2 (3.3)	7 (11.5)	16 (26.2)	9 (14.5)	12 (19.4)	3 (4.8)	24 (38.7)
Moderate	3 (5)	4 (6.6)	11 (18.0)	17 (27.9)	5 (8.1)	11 (17.7)	3 (4.8)	19 (30.6)
High	10 (16.4)	5 (8.2)	12 (19.7)	28 (45.9)	3 (4.8)	13 (21.0)	3 (4.8)	19 (30.6)
Total	20 (33.9)	11 (18.0)	30 (49.0)	61 (100)	17 (27.4)	36 (58.1)	9 (14.5)	62 (100)

**Table 3** - Level of self-esteem in experimental and control group.

Levels	Experimental				Control			
	Low	Moderate	High	Total n (%)	Low	Moderate	High	Total
Low	2 (3.3)	4 (6.6)	9 (14.8)	15 (24.6)	8 (12.9)	4 (6.5)	1 (1.6)	13 (21.0)
Moderate	1 (1.6)	15 (24.6)	11 (18.0)	27 (44.3)	17 (27.4)	4 (6.5)	3 (4.8)	24 (38.7)
High	1 (1.6)	6 (9.8)	12 (19.7)	19 (31.1)	8 (12.9)	14 (22.6)	3 (4.8)	25 (40.3)
Total	4 (6.6)	25 (41.0)	32 (52.5)	61 (100)	33 (53.2)	22 (35.5)	7 (11.3)	62 (100)

**Table 4** - Comparison on the self-esteem and quality of life of the experimental and control group.

Self-esteem/ Quality of life	Experimental				Control				Independent t test df
	Before	After Mean±SD	Effect	Pair t test	Before	After Mean±SD	Effect	Paired t test	
Self esteem	15.52±1.7	20.52±3.04	-5±3.53	df=60*	15.75±2.60	16.96±3.11	-1.20±3.87	df=61 <sup>†</sup>	121*
Quality of life	231.1±4.5	279.2±5.1	-6.34±6.05	df=60*	237.4±3.9	204.8±8.3	74.3±9.8	df=61 <sup>‡</sup>	121*
Total	115.03±13.02	137.08±18.03	22.37±2.20	df=60*	114.48±14.97	119.91±16.98	-5.43±20.51	df=61 <sup>§</sup>	121*

\* $p=0.000$ , <sup>†</sup> $p=0.017$ , <sup>‡</sup> $p=0.124$ , <sup>§</sup> $p=0.041$ . df - degrees of freedom

Paired t test was carried out to assess the effect of QoL improvement on self-esteem and QoL of each group (Table 4). Self-esteem and quality of life score of the study group was higher than that of the control group, and there was a significant statistical difference ( $p=0.000$ ) between post- and pre intervention scores. Table 4 also shows the result of independent t test to compare both experimental and control group, and the post intervention scores of the experimental and control group were significant different based on statistical calculations ( $p=0.000$ ).

**Discussion.** Diabetes is a chronic and debilitating disease that necessitates adjustments in the patient's lifestyle and quality of life.<sup>1</sup> This patient requires self-managing their disease, and is a lifetime struggle to maintain and increase QOL. Treatment plans that inherently improve or include strategies to enhance patients' QOL may increase compliance, thereby improving these patients' metabolic status.<sup>2</sup> The participants in this study suffered impairment in all aspects of QoL, before intervention compared with after intervention. In general, several studies support the results of present study. Larijani et al<sup>22</sup> showed that depression in diabetics is a multifactorial disorder arising from biological and psychosocial factors, and diabetic patients vary in their perceptions of QoL and in their coping styles when dealing with everyday stress.<sup>1</sup> Also self-esteem and QoL concepts were related namely, the higher the self-esteem, the better the QoL in patient with diabetes.<sup>15</sup> In this study, the subjects in the experimental group had low self-esteem scores before

intervention, but they increased their self-esteem score after the intervention, in agreement with performed studies by Swann et al,<sup>23</sup> Taylor TL,<sup>24</sup> and de Sa Novato<sup>25</sup>. The control group obtained moderate self-esteem score before intervention, yet it decreased to low self-esteem score after the intervention. Berman et al<sup>9</sup> showed that linked full stress to chronic disease might decrease personal self-esteem significantly. Therefore, decreased self-esteem scores disabled some subjects of the control group to control blood sugar (they had diabetic foot ulcer, stress, and anxiety). Diabetic patients were depressed for a high rate of complications,<sup>1</sup> and diabetes afflicted subjects are at higher depression risk than the general population.<sup>26</sup> Thus, some teaching and learning techniques must be developed for the patients who need more health education to care for themselves.<sup>27</sup> According to the current study, QoL improvement improves self-esteem of the diabetes-afflicted subjects. The intervention also improved their knowledge of diabetes and their emotional status.

There were some limitations for the current study including personal studies and learning of investigation subjects via mass media and informal educations during information collection. Every subject had his or her deduction of QoL, personal differences, and expectations, and the outcome also depends on the veracity of the investigated subjects and their effective responses to the investigation results. Thus, the investigator could do nothing.

Every investigation result is utilized to improve the current status. Development of regular education plans and emphasis on quality life improvement and self-esteem can reduce depression, mental and physical



damages, and self-esteem, and self-reliance of diabetic subjects increase. Future studies on education and its effect on QoL are necessary to prevent depression and resulting mental disorders of acute diseases, such as acute renal disorders that need hemodialysis, cardiac diseases, lung diseases, metabolic syndrome, cancer, and diabetes type.

In conclusion, the QoL improvement had positive effects on diabetic's self-esteem, and QOL as improved may help to reduce the side effects of type 2 diabetes process.

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